

# Ratio Study Summary

September 15

# 2014

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## **1. STUDY METHODOLOGY**

### **1.1 Data Preparation**

In accordance with ACD rules, counties and their contractors provided ACD with a file of all real property parcels for 2014. The files, provided in Excel format, contained relevant property characteristics, valuation, and sales data as called for in Rule 4.04.1b. We converted these files to a common SPSS format for analysis, checked for duplicate parcels, and removed exempt and other properties outside the scope of the study. Relevant property types were classified as residential improved (RI), commercial improved (CI), or vacant land (VA).

Based on deed types and validation codes we identified sales usable for ratio analysis. We considered only warranty and special warranty deeds and excluded all validation codes enumerated in ACD rules other than VS, VA, UV, or AP. In accordance with ACD rules, we eliminated the lowest 10% of properties in their class (RI, CI, or VA), any sales involving new construction, mobile home properties, and any commercial/industrial properties that constituted more than 5% of the total value of commercial/industrial properties in the county. We combined appraised values for multiple parcel sales. We also performed a special analysis of unverified (UV) sales in which we compared the distribution of ratios for these sales with those of validated sales. We removed extreme ratios for UV sales that both (a) lied outside the distribution of validated sales and (b) fell below 0.25 or above 2.00. Section 1.3 below describes general outlier analysis.

Per ACD rules, one year of residential and vacant land sales and two years of commercial sales are used for analysis in counties with 50,000 or more real property parcels. For other counties, two years of residential and vacant sales and three years of commercial sales are used for analysis.

At the conclusion of exploratory data analysis and sales screening we saved a data file containing both sold and unsold parcels for use in subsequent analyses.

### **1.2 Time Trend Analysis**

Sales were analyzed and adjusted for statistically significant changes in price levels over the relevant study period. Using the sales ratio trend method we conducted a separate analysis for each property type in each county with adequate sales<sup>1</sup>. In each case we began by plotting sale-to-assessment ratios (SARs) against time and temporarily filtering outlier SARs. We studied plots to determine whether trends could be approximated with a straight line. If not, “splines” (multiple straight lines) were defined to approximate the indicated pattern.

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<sup>1</sup> For a more detailed discussion of the sales ratio trend method of time adjustment, see Robert Gloudemans, *Mass Appraisal or Real Property* (IAAO, 1999), pages 265-268 or Robert Gloudemans and Richard Almy, *Fundamentals for Mass Appraisal* (IAAO, 2011), pages 151-155.

Regression analysis was used to test for statistical significance and quantify significant trends. The dependent variable in these analyses was the logarithm of SARs and the independent variable was Months (e.g., 1-24 for two years of data) or segments thereof. For example, if the market appeared to be flat in the first 15 months and then increase over the remaining 9 months, we would test two splines: Months1 (1-15) and Months2 (0-9). For a sale occurring in month 20, Months1 would be coded as 15 and Months2 as 5, since the sale price would reflect any price changes over all 20 months. If the sale occurred in month 10, Months1 would be coded as 10 and Months2 as 0. The logarithm of SAR was used in order to determine percentage changes. If a time trend was found, sales prices were adjusted to the end of the study period at the indicated rate or rates.

### **1.3 Outlier Analysis**

With sales adjusted for time as necessary, we analyzed ratios for outliers and removed those that would compromise the validity of ratio statistics. The analysis began by plotting the distribution of sales ratios on both raw and logarithmic format. We tagged any ratios that were more than 1.5 times the inter-quartile range (IQR) below the 25<sup>th</sup> percentile or above the 75<sup>th</sup> percentile. However, in no case did we trim ratios between 0.60 and 1.40. The resulting trim points and distribution of tagged and untagged sales was analyzed and trim points adjusted as necessary to make logical sense, that is, to ensure that obvious outliers were excluded but that ratios constituting a smooth progression were retained.

A guiding principle in the outlier analysis was, where possible, to remove no more than 5% of ratios for a given property type in a given county. However, when samples were small or ratios exhibited wide dispersion, this general rule was relaxed with the caveats that (a) where possible, no more than 10% of ratios in a class were removed and (b) where possible, no more than 5.5% of all ratios were removed.

### **1.4 Ratio Analysis**

Once outliers were removed, we calculated key ratio statistics for each of the three property types. For each property type, we calculated and reported the number of sales, median ratio, 95% confidence interval for the median, coefficient of dispersion (COD), and price-related differential (PRD). These statistics were also reported by market area, city, and school district.

Separately, using additional sample data provided, we calculated median ratios, 95% confidence interval for the median, and coefficient of dispersion (COD) for agricultural and business personal property; median ratios for non-business personal property (autos) were also incorporated into the study.

Using total assessed values calculated for each of the three major study classes, we divided assessed values by median ratios to obtain estimated total market values for each class. Similarly, using abstract data provided to ACD by counties or their contractors, we divided assessed value for agricultural, business personal and non-business personal property by their respective medians (usually 20%) to obtain estimated market values for each of these property

classes. Finally, we summed assessed values and estimated market values for the six property types and divided aggregate assessed value by aggregate market value to obtain the estimated overall assessment ratio. According to ACD standards this ratio must be between 18% and 22%. In addition, the 95% confidence interval for each of the three major classes must overlap 0.18 to 0.22, as must the 95% confidence interval for residential property and vacant land in each market area. CODs must also comply with requirements set out in ACD rules.

## **1.5 Sold Versus Unsold Parcels**

ACD's rules require the agency to "vigilantly monitor whether counties are appraising unsold properties in the same manner as sold properties." To this end we compared median and average value changes for each of the three property classes and highlighted cases where differences exceeded 10%. We also used the Mann-Whitney test to determine the statistically reliability of observed differences. These analyses were conducted after removing the lowest 5% and highest 5% of value changes for both sold and unsold properties in each of the three classes. In order to ensure that we were only analyzing the true percent increase or decrease between the previous to current appraised values, all parcels containing more than 5% of new construction were also removed from the analysis. Indicated cut points were further adjusted if required to remove unusually large changes.

If initial analysis indicated statistically significant changes of more than 10% based on either the median or mean ratio, we conducted supplemental analyses at the market area and/or neighborhood level. In some cases we compared the percentage of sold and unsold properties for which values were changed and the percentage for which changes exceeded meaningfully thresholds, say 10% or 20%. Based on these comparisons we highlighted instances of systematic differences in value changes between sold and unsold parcels.

## **2. SUMMARY OF FINDINGS**

Attachment 1 summarizes results for the 9 counties included in the 2014 study. In all cases except one (see footnotes on Attachment 1), the level of assessment complies with ACD rules. In all cases except two (see footnotes on Attachment 1), appraisal uniformity (COD) complies with ACD rules.

Statistically significant time trends were not found in any of the nine counties.

As the final column to the table indicates, in all cases the “Sold versus Unsold Parcels” test complies with ACD rules.

### 3. RELEVANT ISSUES

Several rule changes were implemented this year in regards to the Ratio Study:

- Rule 4.04.1b (1) – Changed the January 31<sup>st</sup> Sales Extract report to a Complete Parcel Extract report listing all transfers (deeds) for the prior three years. Several new fields were also added to the extract to aid in time adjustment and preliminary ratio study analysis.
- Rule 4.04.1b (5) – The time frame for listing all transfers (deeds) was changed to the prior three years on the July 1<sup>st</sup> Parcel Extract report. Added the same fields that were added to the January 31<sup>st</sup> Extract report to aid in analysis on the final ratio study.
- Rule 4.04.1c (3a) – Replaced the term Un-validated sale with Unverified sale to more accurately describe this type of sales validation code.
- Rule 4.04.1c (4) – Removed the fixed number of sales validation codes that will be audited. ACD will begin auditing a percentage of the sales validation codes for each county so that all counties will be more proportionately audited.
- Rule 4.04.1c (6) – Previously if there was more than one valid sale for a property during the time frame of the study, only the most recent sale was used in the study. This rule change now includes all valid sales for a property that occur during the time frame of the study. There have historically been a low number of vacant land sales used in the analysis, this change should allow more vacant land sales to be part of the analysis.
- Rule 4.04.1e (5) – More clearly defined the COD standards for Residential properties to 15.0 or less in market areas located in counties with 50,000 or more parcels and 20.0 or less in market areas located in counties with less than 50,000 parcels. Tightened up the COD standards for Vacant land to 20.0 or less in market areas located in counties with 50,000 or more parcels and 25.0 or less in market areas located in counties with less than 50,000 parcels.

Since multiple sales of the same property are now being used in the analysis, the “sale type” field was added to the Extract report to aid in the analysis of these sales. Many counties are coding this field incorrectly or leaving this field blank. It is extremely important that counties use this field and code these sales correctly to ensure that the sales are being analyzed correctly. For example, if a sale occurs on a vacant property and then improvements are built on that property, the “sale type” still needs to be coded as ‘vacant’ so that during the analysis only the appraised land value is compared to the sale price. If the “sale type” field is left blank or coded as ‘improved’, the analysis will compare the total appraised value (which includes improvements) to the vacant land sales price, which will artificially inflate the sales ratio for the property. If enough of these sales are coded incorrectly, it could have a detrimental effect on the overall ratio results causing a county to fail the ratio study and fall out of compliance.

Another area in which improper coding has been detected is occurring with sales that involve multiple parcels. Several coding errors have been discovered on these types of sales on both the “sale type” and “sales validation code” fields. If a multi-parcel sale occurs involving both improved and vacant parcels, then all parcels involved in the sale should be coded as ‘improved’ in the “sale type”, even though some of the parcels may have a vacant property type code. For example, if a sale consists of a house and two vacant lots, the “sale type” should

be coded as 'improved' on all 3 parcels. The "sale type" strictly refers to type of sale (improved or vacant), not the individual property types. The second area where coding errors have been discovered concerning multi-parcel sales are in the "sales validation code" field, both for valid and invalid sales.

- For valid sales, the "sales validation code" for the primary parcel (which should be the most predominate parcel, or better put – usually the parcel with the highest value) should be coded as 'VA' (primary parcel of a group of parcels that have sold) and the remaining parcels should be coded as 'AP' (additional parcels that are linked to the primary parcel). All parcels in a multi-parcel sale should have the same ownership transfer record (sale price, book, page, grantee, grantor, etc.), but for analysis purposes only one of these parcels should remain in the sample, otherwise you will be analyzing the same sale multiple times. The SPSS syntax takes care of this in the following manner: The parcel coded with the 'VA' sales validation code is tagged as the primary parcel, if none of the parcels are coded 'VA' then the syntax will tag the parcel with the highest total value as the primary parcel. The appraised value fields (current and previous) on the primary parcel are replaced with the aggregated values of all parcels contained in the multi-parcel sale to determine the total appraised value for all parcels involved in the sale. The sale price is not aggregated for all parcels since the sale price listed on the deed is already the total sale price for all parcels involved in the sale. Once the values have been combined or aggregated, the parcels not tagged as the primary parcel are removed from the analysis, leaving only the primary parcel in the sample to be used in the analysis. Conflicts occur when the primary parcel of a multi-parcel sale is not coded 'VA'. In some instances when a county is working the deed of a multi-parcel, the first parcel that they determine is part of the multi-parcel sale is coded as 'VA' and then all additional parcels are coded 'AP', even though the first parcel may have been vacant and one of the additional parcels was improved. In this case the improved parcel should have been coded 'VA' and the vacant parcel should have been coded 'AP'. So when this multi-parcel sale is analyzed in SPSS, we will be left with a vacant parcel that contains improved values.
- For invalid sales, if a multi-parcel sale is determined to be an invalid sale, then the same invalid "sales validation code" should be coded on all parcels involved in the multi-parcel sale. In some instances, only one parcel of the multi-parcel sale was coded with the proper invalid sales validation code, while the sales validation code on the remaining parcels of the multi-parcel sale was either left blank or coded with the 'UV' (unverified) code. 'UV' codes remain in the analysis, in the above example, some of these parcels that were determined to be invalid could end up being part of the analysis and distorting the overall results of the ratio study.

Rule 4.04.1b directs counties to supply ACD with a list of all warranty and special warranty deeds for the time frame covered in the ratio study. However, there are no official definitions of deed type codes and counties declare and define these individually. Submitted deed type codes are numerous and sometimes missing, making it difficult to determine whether sales are in fact warranty or special warranty deeds. For example, "CP" represents corporate warranty deeds in some counties and contract for purchase sales in others.

While ACD rules provide a list of allowable rejection codes for invalidating sales to be considered in the study, submitted validation codes sometimes deviated from defined codes,

were simply marked “UV” (unverified), or left blank. Attachment 2 shows the percentage of sales assigned valid and invalid verification codes in each county, as well as the percentage coded “UV” or (less frequently) left blank. The percentage of sales affirmatively assigned valid sales codes (VS, VA, or AP) ranges from 2% to 21%, while the percentage of sales affirmatively assigned invalid sales codes ranges from 21% to 91%. Overall, 20% of sales were assigned “UV” or blank codes, with the percentage ranging from 3% to 59%. While a low percentage of usable sales can be partly explained by the fact that many unusable sales are likely other than warranty or special warranty deeds, the wide ranges indicates considerable diversity in the way sales are coded in each county.

There is nothing in ACD rules to condone the automatic elimination of “UV” or blank sales and IAAO standards call for retaining sales unless there is a specific reason for rejecting the sale. In any case, this year’s study considers only sales that appear to be warranty or special warranty deeds. It retains UV validation codes, which are subject to special outlier analysis as explained previously. However, validation codes not defined in ACD rules were not used. All verified (VA, VS, AP) and unverified (UV) sales were subject to routine outlier analysis.

The following other issues were encountered during the study:

- Blank sale prices were very common in all counties. These reflected deeds that were filed with no revenue stamps. These sales were removed from the study.
- Every county had a small number of duplicate sold parcels that had the same deed references with the exception of differences in the grantee and/or grantor. The duplicate parcels were removed from the study. It appears in most of the instances the counties are inserting additional transfer records for the same deeds to correct or modify the grantee and/or grantor. This should not be occurring, notes should be added to the comment section of the deed’s transfer record.

Attachment 3 contains notes on key findings, problems, and issues encountered in each of the 9 study counties.



**ATTACHMENT 1**  
**2014 Ratio Study**  
**Summary of County Results**

County	Property Class	Years	Sales	Median	LCL	UCL	COD	Time Trend	Solds vs Unsolds
Chicot	Residential	2	94	19.03	18.48	20.23	14.70	None	Pass
	Commercial	3	9	19.91	17.13	24.37	26.40 <sup>(1)</sup>	None	Pass
	Vacant	2	29	20.00	19.20	20.00	12.80	None	Pass
Cleveland	Residential	2	28	19.52	18.79	20.42	8.50	None	Pass
	Commercial	3	4	20.50	16.93	22.60	7.00	None	Pass
	Vacant	2	12	20.00	19.33	20.00	10.80	None	Pass
Dallas	Residential	2	29	20.29	19.65	21.50	7.20	None	Pass
	Commercial	3	5	20.39	18.86	22.80	5.70	None	Pass
	Vacant	2	4	20.13	10.00	24.00	19.60	None	Pass
Howard	Residential	2	102	19.11	18.64	20.11	11.10	None	Pass
	Commercial	3	31	20.63	19.53	21.50	12.20	None	Pass
	Vacant	2	21	20.00	20.00	23.00	9.10	None	Pass
Jackson	Residential	2	204	19.28	18.84	20.20	19.40	None	Pass
	Commercial	3	20	21.30	19.98	25.17	14.40	None	Pass
	Vacant	2	45	20.00	18.70	20.00	14.70	None	Pass
Lafayette	Residential	2	53	19.57	18.58	20.45	11.80	None	Pass
	Commercial	3	5	19.00	17.78	45.44	31.90 <sup>(3)</sup>	None	Pass
	Vacant	2	20	20.07	19.75	21.16	13.10	None	Pass
Lee	Residential	2	35	19.70	19.36	20.02	7.10	None	Pass
	Commercial	3	3	20.38	19.32	20.43	1.80	None	Pass
	Vacant	2	2	23.21 <sup>(2)</sup>	21.43	25.00	7.70	None	Pass
Nevada	Residential	2	68	19.46	18.70	19.96	10.60	None	Pass
	Commercial	3	6	19.73	17.83	22.81	7.70	None	Pass
	Vacant	2	10	19.78	18.20	23.00	7.00	None	Pass
Phillips	Residential	2	89	19.35	18.73	20.13	10.10	None	Pass
	Commercial	3	15	19.80	18.05	21.69	8.60	None	Pass
	Vacant	2	4	20.00	18.67	26.67	10.00	None	Pass

**(1) - Chicot County** - Although the commercial COD of 26.40 exceeds the standard of 25 for commercial properties, it is below the critical value of 34.81 required to conclude non-compliance at the 95% confidence level with (9) sales.

**(2) Lee County** - Although the median ratio for vacant land (23.21) falls above the target range of 18 to 22, the lower end of the 95% confidence interval (21.43) falls into compliance.

**(3) - Lafayette County** - Although the commercial COD of 31.90 exceeds the standard of 25 for commercial properties, it is below the critical value of 38.50 required to conclude non-compliance at the 95% confidence level with (5) sales.

**ATTACHMENT 2**  
**2014 Ratio Study**  
**Distribution of Validation Codes**

County	Sales Considered	% Valid Usable Codes	% Valid Rejection Codes	% Undefined Codes	% Unverified Codes	Undefined Codes
Chicot	2673	4.38%	81.22%	0.79%	13.62%	27, 28
Cleveland	529	8.32%	76.37%	0.57%	14.74%	28
Dallas	1009	4.56%	90.88%	1.19%	3.37%	RF
Howard	780	18.08%	63.97%	0.00%	17.95%	
Jackson	1326	20.74%	20.51%	0.15%	58.60%	FC, MG
Lafayette	579	13.13%	75.82%	0.00%	11.05%	
Lee	929	2.05%	88.48%	0.00%	9.47%	
Nevada	634	16.88%	72.87%	0.00%	10.25%	
Phillips	1337	12.04%	64.77%	0.00%	23.19%	
<b>Totals</b>	<b>9796</b>	<b>10.07%</b>	<b>69.95%</b>	<b>0.39%</b>	<b>19.60%</b>	
Valid Sale Usable Codes:		AP, VA, VS				
Valid Sale Rejection Codes:		AL, AS, CH, CS, CT, CV, DT, DV, ES, FD, FI, FS, GO, IS, MH, MU, NM, OF, OT, PI, PP, RC, RL, TR				
Undefined Validation Codes:		27, 28, FC, MG, RF				
Unverified Sale Codes:		UV or blank				

**ATTACHMENT 3**  
**2014 Ratio Study**  
**County Notes**

**Chicot**

- Although the Commercial Improved COD of 26.40 exceeds the standard of 25.0 for commercial properties in counties with less than 50,000 parcels, it is below the critical value of 34.81 required to conclude non-compliance at the 95% confidence level with (9) sales.
- There were (6) duplicate sold parcels that had the same deed references. These were removed from the study.
- There were (5) parcels that had a zero land value, even though the property type codes for these parcels would suggest that they would include a land value.
- There were (12) parcels that had a zero total value with property type codes that normally would have a value. These should have been coded as voided parcels.
- There were several deed types that were not listed on the Deed Type report submitted by the county (500, OPTION).
- (22) sales had blank sales validation codes. These sales were recoded as 'unverified' and used in the study.
- (2) sales had invalid sales validation codes that were on the original approved list, but have since been removed from the approved list (21, 22). These sales were removed from the study.
- (21) sales had invalid sales validation codes that were never on the approved list (27, 28). These sales were recoded as 'unverified' and used in the study.
- There were several "sale type" coding errors.

**Cleveland**

- There were (7) duplicate sold parcels that had the same deed references. These were removed from the study.
- There were (5) parcels that had a zero total value with property type codes that normally would have a value. These should have been coded as voided parcels.
- There were some parcels that had negative values in the improvement and newly discovered value fields.
- Some parcels with vacant property type codes had improvement values.
- There were several deed types that were not listed on the Deed Type report submitted by the county (CD, CONTR, E.D.).
- (5) sales had blank sales validation codes. These sales were recoded as 'unverified' and used in the study.

- (3) sales had invalid sales validation codes that were never on the approved list (27, 28). These sales were recoded as 'unverified' and used in the study.
- There were several "sale type" coding errors.

### **Dallas**

- The Parcel Extract report did not include any Mineral or Public Service Commission properties, even though these property types are not included in the study the counties should still include these in their Extract report. The Extract report is also used in determining state-wide property type totals.
- There were (4) duplicate sold parcels that had the same deed references. These were removed from the study.
- There were (63) parcels that had a zero land value, even though the property type codes for these parcels would suggest that they would include a land value.
- There were (4) parcels that had a zero total value with property type codes that normally would have a value. These should have been coded as voided parcels.
- There was a deed type that was not listed on the Deed Type report submitted by the county (.WD).
- (2) sales had invalid sales validation codes that were on the original approved list, but have since been removed from the approved list (DV, OT). These sales were removed from the study.
- (12) sales had invalid sales validation codes that were never on the approved list (RF). These sales were recoded as 'unverified' and used in the study.
- There were several "sale type" coding errors.

### **Howard**

- There was (1) duplicate sold parcel that had the same deed reference. This was removed from the study.
- There was (1) parcel that had a zero land value, even though the property type code for this parcel would suggest that it would include a land value.
- There were (24) parcels that had a zero total value with property type codes that normally would have a value. These should have been coded as voided parcels.
- (2) sales had blank sales validation codes. These sales were recoded as 'unverified' and used in the study.
- (1) sale had an invalid sales validation codes that was on the original approved list, but has since been removed from the approved list (RC). These sales were removed from the study.
- There were several "sale type" coding errors.

### **Jackson**

- There were (45) duplicate sold parcels that had the same deed references. These were removed from the study.
- There were (2) parcels that had a zero total value with property type codes that normally would have a value. These should have been coded as voided parcels.
- Some parcels with vacant property type codes had improvement values.
- There were several deed types that were not listed on the Deed Type report submitted by the county (132, BD, LW, PB, qcd, QCD, W).
- (143) sales had blank sales validation codes. These sales were recoded as 'unverified' and used in the study.
- (13) sales had invalid sales validation codes that were on the original approved list, but have since been removed from the approved list (IS, NM, OT). These sales were removed from the study.
- (2) sales had invalid sales validation codes that were never on the approved list (FC, MG). These sales were recoded as 'unverified' and used in the study.
- There were several "sale type" coding errors.
- There appears to be no Neighborhood Delineation (combing subdivisions into neighborhoods). This could have negative impact in the calculation of the COD.

### **Lafayette**

- Although the Commercial Improved COD of 31.90 exceeds the standard of 25.0 for commercial properties in counties with less than 50,000 parcels, it is below the critical value of 38.50 required to conclude non-compliance at the 95% confidence level with (5) sales.
- The Parcel Extract report did not include any Mineral properties, even though this property type is not included in the study the counties should still include these in their Extract report. The Extract report is also used in determining state-wide property type totals.
- There was (1) duplicate sold parcel that had the same deed reference. This was removed from the study.
- There were (9) parcels that had a zero total value with property type codes that normally would have a value. These should have been coded as voided parcels.
- Some parcels with vacant property type codes had improvement values.
- There was a deed type that was not listed on the Deed Type report submitted by the county (CS).
- (155) sales had blank sales validation codes. These sales were recoded as 'unverified' and used in the study.
- (13) sales had invalid sales validation codes that were on the original approved list, but have since been removed from the approved list (IS, NM, OT). These sales were removed from the study.

- There were several “sale type” coding errors.

### **Lee**

- Although the median ratio for Vacant land (23.21) falls above the target range of 18 to 22, the lower end of the 95% confidence interval (21.43) falls into compliance.
- There were (38) duplicate sold parcels that had the same deed references. These were removed from the study.
- There were (155) parcels that had a zero land value, even though the property type codes for these parcels would suggest that they would include a land value.
- There were (61) parcels that had a zero total value with property type codes that normally would have a value. These should have been coded as voided parcels.
- (10) sales had blank sales validation codes. These sales were recoded as ‘unverified’ and used in the study.
- There were several “sale type” coding errors.

### **Nevada**

- The Parcel Extract report did not include any Mineral properties, even though this property type is not included in the study the counties should still include these in their Extract report. The Extract report is also used in determining state-wide property type totals.
- There were (6) duplicate sold parcels that had the same deed references. These were removed from the study.
- There were (7) parcels that had a zero total value with property type codes that normally would have a value. These should have been coded as voided parcels.
- (48) sales had blank sales validation codes. These sales were recoded as ‘unverified’ and used in the study.
- (3) sales had invalid sales validation codes that were on the original approved list, but have since been removed from the approved list (OT). These sales were removed from the study.
- There were several “sale type” coding errors.

### **Phillips**

- During the data preparation phase of the initial analysis, an error was discovered in the Market Area codes, this county has a single Market Area but there were (3) different Market Area codes showing up in the data. After speaking with the appraisal manager it was determined that some of the codes listed in the Market Area were actually Tax District codes.
- There were (8) duplicate sold parcels that had the same deed references. These were removed from the study.

- There were (20) parcels that had a zero land value, even though the property type codes for these parcels would suggest that they would include a land value.
- There were (18) parcels that had a zero total value with property type codes that normally would have a value. These should have been coded as voided parcels.
- There were some parcels that had negative values in the improvement value fields.
- Some parcels with vacant property type codes had improvement values.
- (166) sales had blank sales validation codes. These sales were recoded as 'unverified' and used in the study.
- (2) sales had invalid sales validation codes that were on the original approved list, but have since been removed from the approved list (DV). These sales were removed from the study.